Specifications for Retroreflectometer

1. MEASURMENT PARAMETERS:
   1.1. Illumination and Observation: The retroreflectometer (instrument) should be constructed to meet or exceed the following geometry:
      1.1.1. Illumination/entrance angle of -4.0 degrees
      1.1.2. Observation angle of 0.2 degrees and 0.5 degrees simultaneously.
      1.1.3. Light source shall be CIE illuminant type A.
      1.1.4. Light source and receptor angular aperture of 0.1 degrees.
      1.1.5. Meets ASTM E1709
      1.1.6. Must be equipped with a lens.
      1.1.7. Light must be collimated.

   1.2. Working Range: The instrument shall have a working range of 0 to 2000 $cd*m^2lx^1$
   1.3. Color Correction: The instrument shall have built-in, automatic color correction to allow measurement of various colors or type of sign sheeting. Recalibration shall not be necessary for each individual color or type. Application of a mathematical color correction factor, either manually or through software interface shall not be necessary.
   1.4. Point Aperture or Annular Aperture Geometry Measurement: Either is acceptable.
   1.5. Stray Light Compensation: The instrument shall detect for and compensate for the actual level of stray light present as part of each retroreflectivity measurement.
   1.6. Measurement Area Reduction: The instrument shall be supplied with a lens reducer to allow accurate measurement of small text or background without being affected by surrounding sheeting of different color or type.
2. CALABRATION:
   2.1 Calibration: The instrument shall be supplied with a single white reflection standard and a Zero reflection standard for calibration. The following are the minimum specification: The white reflection standard shall be traceable an accredited national standards laboratory through an ISO 17025 certified calibration and testing laboratory.
3. CONSTRUCTION:
   3.1 Basic Construction: The instrument's optical housing shall be constructed of aluminum with a minimum thickness of 4mm (12 gauge). The instrument shall be rigidly constructed to maintain a fixed geometry and must not contain any foldable or collapsible parts.
   3.2 Portability: The instrument shall be completely self-contained, portable and be supplied with a carrying case.
   3.3 Dimensions: The instrument's physical dimensions shall be a maximum of 83 mm (3.3 in.) wide, 324 mm (12.7 in.) tall, 295 mm (11.6 in.) ling and weigh less than 2.1 kg (4.7 lb.)
   3.4 Power Source: The instrument shall be powered by a removable, minimum 9.6 V, 1.2 Ah NiCd rechargeable battery. The instrument shall be designed so that it can be used with a fresh battery while the low battery is being charged
   3.5 Electronics Shielding: The instrument shall comply with FCC-CFR47 part 15 class to be fully shielded to eliminate external electromagnetic interference with its performance and block internal electromagnetic radiation.

4. USE AND CONTROL:

4.1 Use of the instrument shall be through the use of a touch screen or sealed keyboard, liquid crystal display with user controlled backlighting and finger trigger button.

4.2 Data Storage: The instrument shall utilize internal non-volatile memory for storing measurement data. The instrument shall be capable of collection minimum 1000 measurements. In addition, the instrument shall be capable of attaching a user set identification label to each measurement taken.

4.3 Data Output: The instrument shall be equipped with a serial or USB interface port to allow for software compatible data output, extended control, calibration, and diagnostics.

4.4 Internal Error Detection: The instrument shall indicate to the user on the display whenever a measurement may contain excess stray light. The instrument shall also indicate of the display whenever other detected errors exist such as incorrect calibration or low battery.

4.5 Average: The instrument shall display a running average of measurements results that can be easily reset from the main display.

5. EQUIPMENT:

5.1 The instrument shall be equipped complete with an instrument user's manual, quick guide, TWO batteries, battery charger, stabilizing flange, lens reducer, extension pole kit Windows ^{TM} compatible software with user's manual, data cable, carrying case, and a single white reflection standard and a Zero reflection standard for calibration.

5.2 The instrument shall have a temperature operation range of 0^{o}C to 45^{o}C (32^{o}F to 113^{o}F)

5.3 The instrument shall have ability to be attached to extension kit (minimum 6 feet) and the ability to be operated by a remote display attached to the extension pole.

6. WARRANTY:

6.1 The instrument shall be warranted for a period of one year against defective parts and workmanship.

Brand Name or Alternate:

If a product or service requested by this QUOTE has been identified in the specifications by a brand name, such identification is intended to be descriptive and not restrictive and is to indicate the quality and characteristics of product or service that will be acceptable. Bidders proposing an alternate product or service will be considered for award if such product or service is clearly identified in the bid proposal and is determined by the County to fully meet the salient characteristic requirements listed in the specifications.